The four remaining chapters are devoted to the planets and the moon, meteors, comets, and the stars. All equally interesting with the opening chapters, they deserve equal mention, but space forbids. Suffice it to say that they bring our information of new discoveries in these interesting fields up to date; some beautiful reproductions of the photographs of stellar spectra, taken at the Harvard College Observatory, being among the latest important additions to our knowledge of stellar constitution.

In conclusion, we hope that this excellent work of Professor Langley may go far towards its avowed object in arousing an interest in the new, not *versus*, but to an equal degree of importance with, the old astronomy. There can be no question that it is of as much importance to mankind to-day to know *what* the heavenly bodies are, as *where* they are; and the endowments to obtain men and apparatus (the former more scarce, and the latter more complicated and perhaps expensive) with which to answer the first question should be forthcoming. In the report, some years ago, of the National Academy of Sciences, upon the importance of moving the National Observatory to a new site, the establishment of a physical observatory under government auspices was recommended. This is directly in the line of the purpose of this book, and we trust that the latter may be one of the active factors in bringing into being, under government auspices, an observatory wherein the spectroscope, bolometer and galvanometer, polariscope, and photometer, with the rapid photographic plate as the adjunct of all, may stand on an equally important footing with the meridian-circle and the equatorial with only filar-micrometer attached.

NOTES AND NEWS.

THE latest results of the work of Prof. Josiah P. Cooke and Mr. T. W. Richards give as the atomic weight of oxygen, 15.869 ± 0.0017. This is from a paper presented at the American Academy of Arts and Sciences March 14.

— Hartleben's great atlas, 'Die Erde in Karten und Bildern,' is now well advanced. So far, twenty numbers have been issued. The maps are good lithographs, clearly drawn, well lettered, and not overcrowded with names. They serve admirably the purpose of the general reader. The accompanying text is profusely illustrated, and contains numerous views, costumes, etc. The physical geography is now complete, and is followed by a succinct geography of Europe. The price of the whole atlas is only $14.75.

— In *Science* of March 9, p. 121, 1st column, 29th line from bottom, for '90 mm.' read '65 mm.'

— In *Science* of Feb. 24, p. 96, 1st column, last line, for '108' read '118.'

LETTERS TO THE EDITOR.

Unusual Dermal Ossifications.

IN examining the collection of *Testudinata* in the Yale College Museum, I found in specimens of *Testudo Leithii*, Günth., dermal ossifications, which, so far as I am aware, have never been described.

Each fore-limb of this small tortoise is furnished with a well-ossified shield, which covers the anterior and inner part of the limb. This shield is composed of suturally united ossicles, covered by scales, and corresponding in number to the large scales on the fore-arm. Each ossicle is smooth on the inner side, and elevated into an eccentric tubercle on the outer side.

This condition seems important for the explanation of the origin of the carapace and plastron of the *Testudinata*, and supports my view on this point published elsewhere (*Zool. Anzeiger*, Nov. 22, 1886).

There can be no doubt that this peculiar shield of the fore-foot originally consisted of small, free ossicles. Probably different stages of this condition will be found, if these parts are carefully examined in the *Testudinidæ*.

The elemental form of the carapace was, there seems to be little doubt, exactly the same. There appeared at first distinct ossicles in the skin. With further development in this direction, these ossifications touched each other, forming a closed shield, the single elements of which were connected by suture.

As soon as this shield became connected with the endoskeleton. it found a support, many of the sutures disappeared, and the elements of the shield were disposed according to the arrangement of the endoskeleton.

In the above way the costal plates were developed. The ossicles, finding a support on the ribs, co-ossified with them and with each other.

The plastron has developed in the same way. The basis of the plastron probably consisted of dermal ossifications, generally called 'abdominal ribs.' By the increase of these dermal ossifications, the 'abdominal ribs,' the clavicles, and interclavicle were absorbed, forming a solid shield, in which the clavicles and interclavicle were transformed into epiplastron and endoplastron.

The oldest condition of the plastron of the *Testudinata*, therefore, was solid, and not pierced by fontanelles.

The oldest known representative of the *Testudinata*, *Proganochelys* (G. BAUR, 'Ueber den Ursprung der Extremitäten der Ichthyopterygia,' in *Bericht über die xx. Vers. des Oberrhein. Geol. Vereins*, Stuttgart, 1887, pp. 17, 18), from the triassic of Württemberg, confirms this opinion.

Embryology has nothing to say in this regard. The whole plastron (with exception, perhaps, of the epiplastron) is of dermal origin, and has nothing to do with the endoskeleton; but the ontogenesis of the exoskeleton is of no value for phylogenesis.

There are many authors (especially Cope and Dollo) who think that the representatives of the *Dermochelydidæ* (*Sphargididæ*), *Dermochelys* de Bl. and *Psephophorus* v. Meyer, are original forms; and Cope has created a peculiar group, '*Athecæ*,' for these and some allied genera (*Protostega*, Cope; *Protosphargis*, Cap.).

I cannot agree with this opinion, but consider these forms as the most specialized of the sea-turtles.

One group has developed from a form of *Testudinata* with well-developed carapace and plastron, by dissolution of their elements, into single ossicles, connected by suture (*Dermochelys*, *Psephophorus*). The other group has developed from a form of *Testudinata* by rudimentation of the costal plates (*Protostega*, *Protosphargis*).

The enormous *Chelonia Hoffmanni*, Gray, which has the costal plates very little developed, and the marginals very slender, shows characters between the *Cheloniidæ* and *Protostegidæ*, especially *Protosphargis*, and must rank as a different genus, which I propose to call '*Allopleuron*' (the generic characters are, costal plates, even in the adult, very little developed, covering only one-half of the rib; marginals very slender).

There have never been found mosaic-like dermal ossifications, neither in *Protostega* nor in *Protosphargis*. The plates considered by Professor Cope as probably belonging to the carapace belong to the plastron. The marginals have not disappeared, as in the *Dermochelydidæ*, but are present; those of *Protosphargis*, described by Capellini as probably phalangeal bones, resemble very much these elements in *Allopleuron*.

Sea-turtles have probably been developed at different times and in different localities, in the same way as the gigantic tortoises. The species of the Galapagos Islands are not directly related to those of the islands round Madagascar. Both have originated from two different stocks, — the first from some form of the American continent, the second from some one of African type.

G. BAUR.

New Haven, Conn., March 4.

End of the Swindler.

IT will give undoubted satisfaction to his many victims to learn that the 'swindling geologist,' whose depredations have been so frequently noted in your columns, has been lately convicted of stealing a number of microscopic objectives from the University of Cincinnati, and sentenced to spend five years at hard labor in the Ohio Penitentiary. He was sentenced under the name of O. L. Syrski, but admitted having pursued his calling under a variety of *aliases*, such as Taggart, Vasile, Ellison, Cameron, Douglas, Strong, Lee, Arundal, and Lesquereux. A valuable microscopic objective, found in his possession, awaits identification by the owner.

CHAS. H. GILBERT.

Cincinnati, March 9.